

## IP supports High-Speed USB host controllers

**A**RC HAS ANNOUNCED two USB-host-controller IP (intellectual-property) offerings, the USB-HS SPH (single-port-host) and the USB-HS MPH (multiport-host) cores. The SPH core's latency-based

architecture sports the lowest gate count for a single-port, high-speed host controller and supports USB low-, full-, and high-speed (to 480-Mbps) data bandwidths. The core includes a functional subset of the HS-OTG (On the Go) IP core, is EHCI (Enhanced Host Controller Interface)-compatible, and supports UTM (USB 2.0 Transceiver Macrocell Interface) and ULPI (Unit Level Prototype Implementation) PHYs (physical-layer interfaces). The USB host-specific controllers support programma-

ble features, such as adaptive tuning, programmable fill level, and enhanced streaming, under software control.

The MPH IP core is a superset of the SPH product supporting two to eight controller ports. Each controller port is backward-compatible and can operate individually at high, full, or low speed. The integrated transaction translator enables a combined bandwidth of 480 Mbytes/sec for the high-speed ports to share and a combined bandwidth of 12 Mbytes/sec for the full-speed ports to share.

The SPH and MPH High-Speed USB cores are available as synthesizable, technology-independent VHDL or Verilog RTL source code, and they include simulation testbenches, synthesis scripts, USB software stacks, and class and device drivers. ARC offers PHYs and PHY macrocells that in-

teroperate with the USB controllers through ARC's CertiPHY program. The USB-HS SPH controller is now available for licensing. The USB-HS MPH controller will be available in fourth quarter of this year.

—by Robert Cravotta  
►ARC, [www.arc.com](http://www.arc.com).

## Book provides practical tips on high-speed pc-board design

WHEN DEVELOPING DESIGNS, engineers often face problems they have not previously encountered. Unless you know someone who has successfully solved the problem, you must research the literature for a theoretical hint to the solution or find a solution by trial and error. Both alternatives are time-consuming and error-prone. Now, Lee W Ritchey has written a book that addresses this issue, using his considerable experience in designing high-speed circuits. *Right the First Time: A Practical Handbook on High Speed PCB and System Design, Volume One* presents practical solutions to most of the problems facing developers of high-speed pc-board products.

The author calls this book *Volume One* because, when he was halfway through writing it, he realized that much more remains to discuss about this topic. Yet, he did not want to either delay the publication or complicate the contents by cramming every hint, solution, and illustration into one book. The book attempts to help electrical and electronics engineers, including pc-board designers, to develop correctly functioning boards without rework. It draws on more than three decades' worth of Ritchey's experience in virtual prototyping of high-speed pc boards in all types of products. It discusses all of the steps in the process—from selecting tools to selecting suppliers. It also includes many figures—from schematics to oscilloscope graphs and logic-analyzer outputs—to help you visualize both the problem and the solution.

The 230-pg text also includes a glossary; an extensive bibliography; and appendixes that cover related subjects, such as the description of a plated through hole, how to select a pc-board supplier, and conversion tables. The book sells for \$125, and you can order it from the author's Speeding Edge Web site.—by Gabe Moretti  
►Speeding Edge, 1-707-568-3983, [www.speedingedge.com](http://www.speedingedge.com).

## MOSFETs push figure of merit to 60% below existing value

A SET OF FOUR MOSFETs from Vishay Siliconix pushes the traditional figure of merit—on-resistance time and gate-drain capacitance—to new lows. The lower on-resistance translates to improved efficiency and less heat in a smaller package; the lower gate-drain capacitance improves switching performance at high frequencies. Targeting 20A (Si4390DY and Si7390DP) and 40A (Si4392DY and Si7392DP) output-current designs, these MOSFETs are available in various SO-8 package versions.

Drain- and gate-to-source voltages are 30 and 20V, respectively; on-resistance is approximately 10 mΩ at 4.5V and 13.5 to 16.5 mΩ at 4.5V. Gate-drain capacitance is 10 nC at 4.5V; the figure of merit at that voltage is 135 to 165, depending on model and packaging. These MOSFETs sell for 55 cents each (100,000).

—by Bill Schweber

►Vishay Siliconix, [www.vishay.com](http://www.vishay.com).

►The market for semiconductors in flash memory and DSPs rose 27 and 20%, respectively, in the third quarter of 2003, according to the Semiconductor Industry Association. The increases were driven by cell phones, which account for 12% of semiconductor use.